



Tennessee Department of Health

Traumatic Brain Injury Program

Annual Report

July 2015 – June 2016



Traumatic Brain Injury Program 2015-2016 Annual Report

EXECUTIVE SUMMARY

In 1993, the Tennessee General Assembly passed legislation establishing the Traumatic Brain Injury (TBI) Program in the Department of Health. The TBI Program staff, with guidance from a nine-member, governor-appointed Advisory Council is charged with expanding and revising existing state plans and services for persons with traumatic brain injuries. The program has achieved many accomplishments since its inception. This report contains specific information concerning the progress made from July 2015 through June 2016 in each of the major components of the Traumatic Brain Injury Program.

In Tennessee, approximately 8,000 people per year are injured and admitted to the hospital with traumatic brain injury. Around 6,000 of those injured are Tennessee residents, contributing to a rate of 79 traumatic brain injuries per 100,000 Tennesseans. TBI survivors can experience impairments that affect their physical, cognitive and behavioral functioning which in turn impacts their ability to return to home, school and work. Whether the injury is the result of a car crash, a fall, assault or sports activity, there can be an economic and emotional toll on the survivor and the family. The focus of the TBI Program is to improve services available to survivors of TBI and their families.

Traumatic Brain Injury Advisory Council

The nine-member governor appointed Advisory Council has met quarterly since 1994. The Council is composed of individuals dedicated to improving the lives of TBI survivors across Tennessee. Their guidance and recommendations have been invaluable to the development of the TBI program.

Federal Grant

Beginning in 2000, the Traumatic Brain Injury Program was awarded a grant from the U.S. Health Resources and Services Administration (HRSA). The TBI Program used the funding to develop an education and training program for school personnel. Entitled Project BRAIN, the overall goal of the grant project is to improve educational outcomes for children with brain injuries in Tennessee. Since the original grant award in 2000, the TBI Program has received a total of \$2,841,000 in federal funding, and \$1,000,000 from the Department of Education for matching funds.

Case Management

Service Coordinators are established in eight locations and cover all 95 counties, providing case management services to TBI survivors and their families. Services for children and adults include: providing information; making referrals to services and agencies; assisting consumers in applying for and accessing services; advocacy; support group development; and developing new programs and activities. The role of the Service Coordinator is to assess an individual survivor and to coordinate available resources within the community. The eight service coordinators are serving an average case load of sixty-one survivors. During FY16, the service coordinators collectively provided information on TBI to over 11,000 callers.

Directory of Program and Services

A comprehensive resource directory, *Traumatic Brain Injury Services Directory and Resource Information Guide* has been distributed statewide to health care facilities and TBI professionals and has served to increase awareness of the TBI program. The directory is also available on the program web site: <http://tn.gov/health/topic/tbi>

Traumatic Brain Injury Registry

Hospitals are mandated to provide information to the department and all are in compliance. Data is available starting from the first quarter of 1996. Analysis of the data allows staff to determine where and how injuries are occurring, what age groups are affected, and what prevention programs may be needed. During 2015, the number of persons in Tennessee admitted to the hospital with at least one brain injury diagnostic code was 7,214. All Tennessee residents listed on the registry receive a letter and program brochure to inform them of the services available through the TBI program.

Clearinghouse

The TBI clearinghouse with a toll-free 800 number has been operational since 1994. Information is routinely updated on available programs and services across the state. A TBI brochure has been broadly distributed. The Program has a web page on the department website: <http://tn.gov/health/topic/tbi>

Education and Prevention

The TBI program collaborates each year with the Brain Injury Association of Tennessee to present an annual statewide conference. The TBI Coordinator also participates on the Injury Control and Prevention committee which is currently developing a state plan for fall prevention.

Traumatic Brain Injury trust fund

The fund has been established by the Department's Bureau of Administrative Services, and revenues have been deposited into the fund as they have been received.

Grant Program

The TBI Program is authorized to award grants for home and community based programs to address the needs of TBI survivors in Tennessee. The majority of the program revenues of \$1 million are allocated for grants. In FY16, services provided through grants included:

- The eight TBI service coordinators served an average case load of 61 survivors, assisting them with accessing local resources and programs. They collectively made 76 educational presentations to a total of 2,639 persons. The service coordinators also provided 39 exhibits on brain injury that were seen by 12,469 participants.
- The three Project BRAIN Resource Specialists provided 23 trainings to 830 school and health professionals. BRAIN staff also provided nine concussion trainings to 489 participants.
- Supportive living services were available to nine survivors living in two affordable and accessible apartment facilities in Memphis. In addition, personal care services were available to 14 residents of Crumley House Brain Injury Rehab Center.
- Fifty-nine adult and youth survivors of brain injury attended camp sessions.
- Project BRAIN transition liaisons in three children's hospitals provided 14 trainings to 50 healthcare professionals and have assisted over 1,500 families in their transition from hospital to home to school.

Youth Sport-Related Injuries

In April 2013, the Tennessee General Assembly passed legislation aimed at reducing youth sports concussion and increasing awareness of traumatic brain injury. The required educational materials are free of charge and available from the Tennessee Department of Health website: <http://tn.gov/health/article/tbi-concussion>

Conclusion

Although much has been accomplished, injuries persist. Work must continue to address the needs of all survivors in the state. The TBI Advisory Council extends their gratitude to the General Assembly for the opportunity to improve the lives of TBI survivors statewide.

**Tennessee Department of Health
Traumatic Brain Injury Program**

**ANNUAL REPORT
July 2015– June 2016**

In 1993, in response to testimony presented by TBI survivors from across the state, the Tennessee General Assembly established the Traumatic Brain Injury Program in the Department of Health to address the special needs of survivors of brain injuries and their families.

In Tennessee, approximately 8,000 people per year are injured and admitted to the hospital with traumatic brain injury. Around 6,000 of those injured are Tennessee residents, contributing to a rate of 79 traumatic brain injuries per 100,000 Tennesseans. An additional 54,380 emergency department visits were related to a TBI during 2014. Survivors can experience impairments that affect their physical, cognitive and behavioral functioning which in turn impacts their ability to return to home, school and work. Whether the injury is the result of a car crash, a fall, assault or sports activity, there can be an economic and emotional toll on the survivor and the family. The focus of the TBI Program is to improve services available to survivors of TBI and their families.

This report contains specific information concerning progress made from July 2015 through June 2016 in each of the major components of the TBI Program as well as pertinent historical information. The TBI Program is housed in the Department of Health, division of Family Health and Wellness, Injury Control and Prevention section. Currently, staff consists of a Program Director and an Epidemiologist that oversees the TBI registry.

The enabling legislation calls for the establishment of a state TBI registry, a TBI trust fund and a number of duties for the Coordinator. Each of these areas is addressed by first citing the Tennessee Code Annotated (T.C.A.) followed by a description of activities and progress.

T.C.A. 68-55-102 & 103. Advisory Council established – Duties

The TBI Advisory Council was organized in accordance with the legislation to provide advice and guidance to the TBI program staff. The nine-member Council is appointed by the Governor and includes representatives from the Departments of Education, Mental Health and Substance Abuse Services, Human Services and Intellectual and Developmental Disabilities. An additional member represents the Tennessee Hospital Association. Five of the nine members represent the category of TBI survivor, family member or primary care giver. The Council was organized in 1994 and has met quarterly since that time.

During 2015-2016, the TBI Advisory Council was comprised of the following members:

Avis Easley, Chair, Departments of Mental Health/Intellectual Disabilities

Lana Bennett, Survivor

Alicia Fitts, Family member

Alison Gauld, Department of Education

Mark Heydt, Tennessee Hospital Association

Rhonda Hicks, Primary Care Giver

JoAnne Morris, Department of Human Services

Brian Potter, Primary Care Giver

Michelle Stanton, Survivor and Primary Care Giver

TBI Advisory Council members



The duties of the advisory council are to advise the TBI coordinator, make recommendations and perform other duties as necessary for the implementation of a state-wide plan to assist TBI persons and their families. The Advisory Council is composed of individuals dedicated to improving the lives of TBI survivors in Tennessee. Their advice and

recommendations have been invaluable to the development of the TBI program. The TBI Advisory Council is currently investigating options to utilize available resources in the TBI trust fund for the benefit of TBI survivors.

T.C.A. 68-55-201. TBI Coordinator to be designated.

The commissioner shall create a full-time position within the department and designate a person as the TBI coordinator to supervise and coordinate the development, implementation and enhancement of a registry and services system for persons with TBIs and provide sufficient staff to accomplish the effect and intent of this chapter. The TBI coordinator shall, to the fullest extent possible, utilize the services of the advisory council in fulfilling the duties and responsibilities required by this chapter.

The current full-time TBI coordinator (program director) has been in place since 1994, supervising and directing the program as described in this report. The TBI registry was established in 1994; the service system is described in this report. Staff includes the program director and the epidemiologist that oversees the TBI registry. The program director consults with Advisory Council members at least quarterly to secure their advice and guidance.

T.C.A. 68-55-202. Duties. –

(a) The TBI coordinator shall:

(1) Aggressively seek and obtain funding, on an ongoing basis, from all available sources, including but not limited to Medicaid waivers and for expansion of the Medicaid program, private and federal funds needed to implement new state plans and services, and to expand and revise existing state plans and services for persons with traumatic brain injuries, including case management;

The TBI Coordinator continuously seeks additional funding from all available sources.

Medicaid Waiver: The TBI community continues to promote the idea of a TBI specific Medicaid waiver. The administration has indicated that TBI survivors may be eligible to participate in existing waivers for the elderly and disabled or through the TennCare Choices program.

Federal Grant award: Since 2000, the Traumatic Brain Injury Program has been the recipient of a grant from the U.S. Health Resources and Services Administration (HRSA). In 2015, responsibility for the TBI federal grant moved from HRSA to the Administration for Community Living (ACL). The original three-year grant had as its focus the provision of education and training for educators, families and health professionals who support students with TBI. The grant project, entitled Project BRAIN, has the overall goal of improving educational outcomes for children with brain injuries in Tennessee. In June 2014, the TBI Program was awarded a new four-year, \$250,000 per year grant to continue and expand the work of Project BRAIN. Since the original grant award in 2000, the TBI Program has received a total of \$2,841,000 in federal funding, and \$1,000,000 from the Department of Education for matching funds.

Project BRAIN staff



Expansion of services: The expansion of services for TBI survivors is accomplished through the grants program as outlined in Section 68-55-402 below. In addition, program staffs collaborate with other relevant agencies such as the Tennessee Disability Coalition, the Brain injury Association of Tennessee and the Epilepsy Foundation to improve services for all persons with disabilities in the state.

Project BRAIN has expanded their services by funding a transition liaison program in three children's hospitals across the state. The Brain Injury Transition Liaisons (BITLs) work in Monroe Carell Jr. Children's Hospital at Vanderbilt in Nashville, Le Bonheur Children's Hospital in Memphis and Children's Hospital at Erlanger in Chattanooga.

Erlanger BITL training hospital staff

A BITL follows up with families after they leave the hospital emergency department if their child has been treated for TBI. When families consent to receive follow up calls, they can also be supported by the Department of Education. During FY15, the BITLs served over 1,500 families.



Case management: There are currently eight Service Coordinators assisting TBI survivors and their families in all 95 counties through contract arrangements with various non-profit agencies. Each agency has established a Brain Injury Support Center in their respective area for the purpose of providing service coordination for children and adults with TBI. These services include: providing information, referring consumers to appropriate services and agencies, assisting consumers in applying for and accessing services, advocacy, support group development and the development of new programs and activities.

Success Story

A gentleman who received a registry letter called his local TBI service coordinator and said he had been unemployed and sitting at home after his injury. The service coordinator advocated for him at Voc Rehab and was able to get him accepted to the TBI program at the Tennessee Rehab Center in Smyrna. The man graduated after seven months and today has a good job in the construction business.

The role of the Service Coordinator is to work with the individual survivor to assess needs and to collaborate and coordinate resources within the community on behalf of the client. The eight service coordinators are serving an average case load of 64 survivors and families. During FY16, the service coordinators collectively provided information on TBI to over 11,000 callers.

The TBI service coordinators and the Project BRAIN staff work closely to serve survivors and families. In October 2015, the TBI Service coordinators and the Project BRAIN staff attended a training retreat to allow them the opportunity to share resources, participate in team building and to discuss issues of common ground.



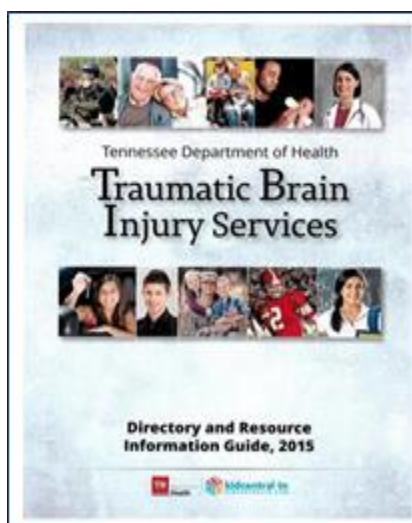
TBI Service Coordinators

Coordinator duties (continued)

(2) Seek funding, on an ongoing basis, and, in conjunction with other state agencies, prepare, coordinate, and advocate for state appropriations needed to fund and to develop services to implement the state plan:

The TBI Program Director and the Advisory Council seek funding on an ongoing basis. The composition of the Council, which includes representatives from the other state departments that also serve persons with brain injury - Education, Mental Health and Substance Abuse Services, Human Services and Intellectual and Developmental Disabilities - provides an opportunity for cooperation and collaboration. The Department of Education is a long-term partner on Project BRAIN, promoting the program to schools and providing substantial financial support.

(3) Identify available programs and services and compile a comprehensive directory of identified programs and services:



A comprehensive resource directory, *Traumatic Brain Injury Services Directory and Resource Information Guide, 2015* has been distributed statewide to health care facilities and TBI professionals and has served to increase awareness of the TBI program. The directory is also available on the program web site: <http://tn.gov/health/topic/tbi> In addition, all the TBI service coordinators develop resource files for their local service areas.

(4) Provide technical assistance and define gaps in service delivery and spearhead the development of those services needed for a comprehensive system of service delivery;

The TBI office provides technical assistance as requested by consumers, families and providers. Examples include providing information on services and programs, referrals to rehabilitation programs and other types of facilities and making connections to support groups. The TBI office also conducts annual technical assistance site visits with all TBI contractors.

The Service Coordination project described above [TCA 68-55-202 (a)(1)] is designed to assist survivors and their families overcome the gaps in services in their communities.

(5) Implement, oversee and receive surveillance data from the Tennessee Brain Trauma Registry to use in developing and revising the state plan to meet the changing needs of this population:

The TBI registry data has been a valuable tool in documenting the need for TBI services and in program planning. Data from the TBI registry enabled successful application for the most recent federal grant award that resulted in Project BRAIN. According to the registry, in 2012, there were 1,071 children and youth ages 3-21 in Tennessee who were admitted to the hospital as a result of a TBI. That same year, the Department of Education classified 307 students in the category of TBI. The discrepancy in the number of children identified through the TBI Registry in comparison to the number of children classified by DOE indicated a need for correct identification of students with TBI. Project BRAIN is designed to address that need.

Registry data on sports concussions highlighted a problem in the state and as a result Tennessee became the 44th state to pass a sports concussion law designed to reduce youth sports concussions and increase awareness of traumatic brain injury.

The TBI Coordinator serves on the Department's Council on Injury Prevention and Control which is funded by a grant from the CDC. The TBI registry data is one of the data sources being used to identify areas of need.

(6) Evaluate surveillance data regarding the quality of services provided and outcome and impact on the quality of life of this population, including reintegration and productivity in the community;

As noted in TCA 68-55-202(a)(5) above, surveillance data is limited. The type of information being collected in the registry does not include the quality of services provided. The TBI program at the Tennessee Rehabilitation Center provides reports on the outcome and impact of the quality of life of this population, particularly in community reintegration and productivity.

(7) Promote research on the causes, effects, prevention, treatment and rehabilitation of head trauma injuries;

The development of the state registry and the resulting availability of statistics are directed toward encouraging research on the causes, effects and treatment of brain trauma injuries.

The collection of all types of information on TBI through the clearinghouse will further identify areas for research development. Education and injury prevention activities for health care providers and the public provide baseline data for pursuing further investigations.

Service Coordinator prevention exhibit



(8) Serve as a clearinghouse for the collection and dissemination of information collected on available programs and services. A statewide, toll-free telephone line shall be established and operated during normal business hours for the express purpose of providing such information to callers.

The TBI clearinghouse with a toll-free 800 number has been operational since 1994. Information is available on service coordination, rehabilitation facilities, day programs, respite care, transportation and financial issues. To publicize the clearinghouse, a TBI program brochure has been broadly distributed. The Program has a web page on the department website:

<http://tn.gov/health/topic/tbi>

(b) Utilizing the services and expertise of the advisory council to the greatest extent possible and in cooperation with the advisory council, the TBI coordinator shall:

(1) Develop a coordinated case management system, a short-term state plan, a long-term state plan, affordable and accessible home and community based services, and criteria to identify training needs and priorities for all persons serving TBI clients;

The case management system known as Service Coordination and described in TCA 68-55-202 (a)(1) covers all 95 counties in the state. The Advisory Council and TBI coordinator have developed short term and long term goals and objectives for the program following the outline of the legislation. Efforts to provide affordable and accessible home and community-based services are on-going through the TennCare Choices program. Currently, the TBI program is providing personal care services on a limited basis through a contract arrangement in select facilities in Memphis and Johnson City. Training needs of persons serving TBI clients are identified and addressed at the annual statewide conference.

(2) Establish and provide for the centralized organization of a statewide family clearinghouse of information, including availability of services, education and referral to survivors, professionals, and family members during the early stages of injury in the acute hospital setting.

Through the development of the TBI Resource Directory and in establishing the TBI registry, contacts have been made in the hospitals where acute care is provided. The service coordinators have also developed referral relationships with their local hospitals. Copies of the updated Resource Directory are distributed to facilities statewide and awareness of the TBI Clearinghouse continues to increase. With the improved system of reporting to the registry and letters being sent to survivors, coupled with service coordinators in place across the state, information and assistance is available to survivors and family members in the early stages of injury and throughout the lifespan.

(3) Assure statewide compliance with licensure, if any, and performance standards through regular service monitoring, site visitation, and self-appraisal;

(4) If licensure is required, monitor and update licensure requirements specific to this population;

The Department of Health oversees certification and licensure of health care facilities in Tennessee. The TBI Program coordinator works with appropriate staff to ensure licensure compliance and to monitor and update licensure requirements specific to this population as needed.

(5) Seek funding and other resources to assure that state personnel working with this disability group are properly trained and provided, at least annually, an opportunity to attend formal or informal education programs through colleges, workshops, seminars, or conferences;

Family Day Conference 2016



The TBI program collaborates with the Brain Injury Association of Tennessee to plan and present an annual statewide conference. The plan for the 2016 brain injury conference was to take a different approach from the usual one-day conference and have two half-day training sessions, one for survivors and families and a second for professionals. Co-sponsored by the Epilepsy Foundation of Middle & West Tennessee, the agenda for the Family Day included a keynote speaker addressing caregiver issues. Other

sessions featured first aid for seizures, interacting with law enforcement and a panel on survivor and family issues. The Family Day conference for survivors and family was a great success. The professional conference, presented in collaboration with Pi Beta Phi Rehab at Vanderbilt Bill Wilkerson Center, focused on continuum of care for TBI pediatric survivors from trauma through rehab. Each half-day session attracted approximately 90 participants. Being able to offer the two event days at no cost for families and professionals was a nice option this year.

The TBI staff and service coordinators, as well as the Project BRAIN staff, regularly present at seminars and workshops, enhancing the ability of state personnel to meet the needs of survivors. During FY16, the TBI service coordinators collectively made 76 educational presentations to a total of 2,639 persons. They also provided 39 exhibits on brain injury that were seen by 12,469 participants.

(6) Ensure updates and compliance standards from the National Head Injury Foundation's quality standards committee are made available to professionals and providers, on a timely basis, to help educate providers and professionals regarding the latest technology available to this disability group;

In addition to regularly scheduled trainings and the annual conference, the TBI program has developed a TBI Community Listserv to provide information on the latest technology available for the TBI community.

(7) Oversee efforts to better educate the general public concerning the need for head injury prevention programs and the need for early intervention, including but not limited to, developing plans and programs for affordable post-acute rehabilitation services, long-term care programs, respite services, and day treatment programs to deal with those who have lifelong disabilities, as well as developing plans and programs to deal effectively with TBI students in the educational system;

The TBI Program collaborates with the Brain Injury Association of Tennessee to present an annual conference focusing on current topics including prevention and the need for early intervention. In addition, the TBI Service Coordinators provide prevention programs in their respective service areas. Project BRAIN, our federal grant project, is a program designed specifically to deal effectively with TBI students in the educational system.

Project BRAIN at Kids Central Event



Information on post-acute rehabilitation services, respite services, and day programs are included in the TBI clearinghouse and the TBI Resource Directory.

Project BRAIN staff at conference



Project BRAIN seeks to link hospital and community health providers with school professionals for identifying and addressing the needs of students with brain injuries. A specially designed TBI curriculum, *Brain Injury 101*, is used to train educators, health professionals and families. Project BRAIN provides training in any school system in the state upon request.

(8) Work with vocational rehabilitation and other state agencies to offer incentives and to obtain cooperation of private industries to initiate on-the-job training and supported employment for TBI persons;

The TBI staff maintains a close working relationship with Vocational Rehabilitation counselors and the TBI program at the Tennessee Rehabilitation Center in Smyrna. The comprehensive program there provides job skills training and placement for approximately 45 students a year. The Vocational Rehabilitation TBI program staff work with VR counselors located throughout the state. This helps promote incentives and obtain cooperation of private industry to initiate on-the-job training and supported employment opportunities for persons with traumatic brain injury. TBI staff is available to provide technical assistance as requested.

(9) Assist in obtaining grant funding and provide technical assistance for the Tennessee Head Injury Association (THIA) to develop policies and procedures to maximize self-determination and self-advocacy of a person suffering a TBI.

The TBI program has established an excellent working relationship with the staff and board of the Brain Injury Association of Tennessee (BIAT)(formerly THIA). In FY16 the TBI Program continued to support BIAT's work with survivors and their families. A grant from the TBI program

funded a part-time executive director who acts as an advocate to improve funding for services benefiting TBI survivors. In addition, the Nashville Area Service coordinator is housed at BIAT. Having the service coordinator at the BIAT office allows a direct connection for BIAT callers, resulting in the survivors receiving services more efficiently.

The TBI Service Coordinators facilitate brain injury support groups across the state. These monthly meetings of the support groups provide a way to meet educational, social and emotional needs of survivors and families.

T.C.A. 68-55-203. Brain Trauma Registry -- The commissioner shall establish and maintain a central registry of persons who sustain traumatic brain injury. The purpose of the registry is to: (1) collect information to facilitate the development of injury prevention, treatment and rehabilitation programs; and (2) ensure the provision to persons with traumatic brain injury of information regarding appropriate public or private agencies that provide rehabilitation services so that injured person may obtain needed services to alleviate injuries and avoid secondary problems.

The TBI registry is supported by an Epidemiologist housed in the Family Health and Wellness section. Data collection officially began with patients discharged during 1996. Reporting hospitals complete a questionnaire for inpatients with TBI-specific ICD-9 or, as of October 2015, ICD-10 diagnosis codes whose admission and discharge dates are different and for those individuals who died. Hospitals are required to report within six weeks of the end of the quarter.

Patients seen in emergency rooms who were sent home the same day are not required to be reported to the registry. All hospitals in the state are currently in compliance with this legislation although some do not report on time. The data enables staff to pinpoint the population being affected by brain injury and are used for injury prevention and health care planning. [See also TCA 68-55-202(a)(5)]



TBI Registry Epidemiologist

All Tennessee residents listed on the registry receive a letter and program brochure to inform them of the services available through the TBI program. In FY16, 5,174 letters were mailed. For many, the letter is the first link to information regarding needed rehabilitation services and programs.

According to 2015 final data, the number of persons in Tennessee admitted to the hospital with at least one head injury diagnostic code was 7,214. Accidental falls were the leading cause at 52% of all causes. A summary of registry data for 2015 is included as Attachment 1.

T.C.A. 68-55-401. Traumatic Brain Injury fund. -- There is hereby established a general fund reserve to be allocated by the General Appropriations Act which shall be known as the “traumatic brain injury fund” hereafter referred to as the fund. Money from the fund may be expended to fund the registry, the TBI coordinator position, and additional staff requirements and other expenditures and grants under the provisions of this chapter.

The fund has been established in the Department of Health and revenues have been deposited into the fund as they have been received. The Fund Balance as of June 30, 2015 was \$1,208,323.78. Funds are used appropriately to cover staff positions and to fund grants. The TBI Advisory Council is currently investigating additional options to utilize available resources to the benefit of TBI survivors.

T.C.A. 68-55-402. Grant Programs. -- From the revenues deposited in the traumatic brain injury fund, the Department of Health is authorized to provide grants to county and municipal governments and/or not for profit organizations for home and community based programs to serve the needs of TBI persons and their families. The department is authorized to establish such grant programs and to develop criteria for eligible applicants.

In accordance with the legislation, the TBI program has awarded numerous grants for a variety of projects since 1995. Examples include:

- Crumley House Brain Injury Rehabilitation Program in Johnson City expanded their day program to provide recreation, transportation and respite care to TBI survivors and their families.
- Mid-South Head Injury Association in Memphis and Brain Injury Association of Tennessee used grant funds to develop a comprehensive proposal to build affordable, accessible, supportive housing for forty-eight TBI survivors using HUD Section 811 grant dollars in Memphis and Nashville.
- The Division of Rehabilitation Services, Tennessee Rehabilitation Center in Smyrna created a specialized rehabilitation program for TBI persons.
- The Tennessee Emergency Services for Children Project received funds to improve the capability of 54 rural hospitals in the early management of acutely injured children.

- Centerstone Community Mental Health Centers, Inc. provided intensive in-home counseling and behavioral intervention for TBI students in 24 counties of middle Tennessee.

As a part of the contract renewal process for the fiscal year starting July 1, 2016 department staff, including TBI Program staff were instructed that contracts would be awarded on a competitive basis. As stewards of state funds, the state must make every effort to ensure that interested organizations and agencies are afforded the opportunity to be contractors for the state. To that end, a Request for Grant Proposal (RFGP) was issued for services for TBI survivors.

In FY16, grant awards provided the following services:

- Meritan provided personal care services for individuals with TBI who live in two accessible, affordable apartment buildings in Memphis.
- Crumley House Brain Injury Rehab Center offered respite and personal care assistance to TBI survivors.
- Easter Seals Tennessee provided camp and recreational opportunities for adults and youth with TBI.
- The Brain Injury Association of Tennessee employed a part-time executive director.
- The Tennessee Disability Coalition managed and implemented the HRSA/ACL grant that funds Project BRAIN.
- Grants for service coordination were awarded to:
 - Fort Sanders Regional Medical Center
 - Brain Injury Association of Tennessee
 - Regional One Health in Memphis
 - Epilepsy Foundation of Middle Tennessee
 - Crumley House Brain Injury Rehab Center
 - Chattanooga Area Brain Injury Association
 - Jackson Madison County General Hospital District

Success Story

A brain injury survivor, a woman, had had poor dental care which made it difficult to find work. The service coordinator connected her to a local dental clinic and also managed to find additional funds to pay for dentures through a women's group at a local church. Currently the woman is working at McDonald's, where she has been employed for the last

Part 5 Youth Sport-Related Injuries [Effective January 1, 2014.]

Tenn. Code Ann. § 68-55-501 to 503 (2013)

In April 2013, Tennessee became the 44th state to pass legislation aimed at reducing youth sports concussion and increasing awareness of traumatic brain injury. Both public and private school sports and recreational leagues for children under 18 that require a fee are affected by the new law. The law covers all sports. The TBI Program staff led the effort to convene an interdisciplinary team of experts to review materials and make

recommendations. The required educational materials are free of charge and readily available from the Tennessee Department of Health website: <http://health.tn.gov/TBI/concussion.htm>

Conclusion

The TBI Program is authorized to award grants for home and community based programs to address the needs of TBI survivors in Tennessee. The majority of the program revenues of \$1 million are allocated for grants. In FY16, services provided through grants included:

- The eight TBI service coordinators served an average case load of 61 survivors, assisting them with accessing local resources and programs.
- The TBI service coordinators collectively made 76 educational presentations to a total of 2,639 persons. They also provided 39 exhibits on brain injury that were seen by 12,469 participants.
- The three Project BRAIN Resource Specialists provided 23 trainings to 830 school and health professionals. BRAIN staff also provided nine concussion trainings to 489 participants.
- Supportive living services were available to nine survivors living in two affordable and accessible apartment facilities in Memphis. In addition, personal care services were available to 14 residents of Crumley House Brain Injury Rehab Center.
- Fifty-nine adult and youth survivors of brain injury attended camp sessions.
- Project BRAIN transition liaisons in three children's hospitals provided 14 trainings to 50 healthcare professionals and have assisted over 1,500 families in their transition from hospital to home to school.

Recommendations

Although much has been accomplished, injuries persist. Work must continue to address the needs of all survivors in the state, particularly in the areas of day programs, housing, long-term care, and rehabilitation. The Council respectfully recommends that the legislature continue to support making home and community-based services available as an alternative to institutional care.

The TBI Advisory Council commends the legislature for the passage of the sports concussion law which has the potential to improve the safety of sports statewide and extends their gratitude for the opportunity to work to improve the lives of TBI survivors statewide.

Traumatic Brain Injury Surveillance Annual Report 2015

Division of Family Health and Wellness

June 2016



A Note to the Reader

Readers should interpret all findings with caution. In some cases (particularly looking at county-level data), the counts included in this report are small (<20) and therefore may be statistically unreliable.

We encourage caution in interpreting findings and comparing differences across counties. If you have questions about particular data points or need assistance interpreting the data, please contact:

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Executive Summary

In 1993, the Tennessee General Assembly established the Tennessee Traumatic Brain Injury Program and Registry. The Registry began collecting data on Traumatic Brain Injuries (TBI) in 1996, producing an annual report summarizing the prevalence of TBI across the state. Since its inception, the Registry has collected data on almost 150,000 patients and has been able to connect Tennesseans with traumatic brain injuries to available resources. The data from the Registry has been advantageous in detecting populations at risk for and prevalent mechanisms of TBI in order to enhance and tailor prevention efforts. The findings in this report serve to continue these efforts.

Key Findings

- A total of **9,288** patients were reported to the TBI Registry during the 2015 calendar year. Of these, **8,050** presented with a TBI-related hospitalization (length of stay \geq 24 hours) or death.
- **55%** of all TBIs were in the senior population (over 55 years).
- Overall, **60%** of TBI patients were males. Male TBI patients exceeded females in each age group except in those over 75 years.
- Falls were the leading cause of TBI in Tennessee, followed by motor vehicle accidents.
- Less than **5%** of concussions in 2015 were sports-related, and these are likely underestimated.
- The age-adjusted TBI hospitalization rate for Tennesseans in 2015 was **79.16 per 100,000**, while the age-adjusted death rate was **9.66 per 100,000 residents**.

Traumatic Brain Injury in Tennessee

Introduction

Traumatic Brain Injuries (TBIs) are acquired injuries, caused by a “bump, blow, or jolt to the head, or a penetrating head injury that disrupts the normal function of the brain¹”. Because of the nature of these injuries, TBIs are a major cause of death and disability, making these a significant public health problem across the United States. In order to address the needs of Tennesseans who have sustained a TBI, the Tennessee General Assembly established the Tennessee Traumatic Brain Injury Program and Registry in 1993.

The Tennessee Traumatic Brain Injury Registry collects data from all non-federal hospitals statewide for the main purpose of connecting TBI patients with resources available during the course of their recovery. Reporting hospitals (n=130) are mandated to submit all traumatic brain injury-related hospitalizations (patients with a length of stay over 24 hours) and TBI-related deaths (patients who expire at or before reaching the facility) to the Registry. TBI-related emergency department visits are increasingly reported, but not required to be reported.

This data serves to analyze the causes of TBIs in Tennessee and support the planning and implementation of initiatives to reduce these injuries throughout the state. Information presented in this surveillance summary is based on final data collected by the Tennessee TBI Registry for the calendar year of 2015.

*The Tennessee
Traumatic
Brain Injury
Registry
officially began
collecting data
in 1996.*

1. Basic Information about Traumatic Brain Injury and Concussion. (2016, January 22) Retrieved from: <http://www.cdc.gov/traumaticbraininjury/basics.html>

General

In 2015, 9,288 individual encounters were reported to the TBI Registry. Of these, a total of 8,050 patients were either hospitalized or expired. 1,236 TBI patients with a length of stay less than 24 hours (classified as an emergency visit/observation), were also reported to the Registry. However, since these cases are not required to be reported, as outlined in the Rules of the Registry, they are **not** included in this analysis.

On average, 8,000-9,000 TBI-related hospitalizations occur in Tennessee annually.

Overall, 90% of TBI were alive at discharge (Table 1). 53% of TBI-related hospitalizations are released with self-care instructions, indicating a modest level of independence and less disability. However, a significant portion (32%) of TBI patients requires further, potentially more extensive treatment post-hospitalization. Out of the 7,214 patients admitted and alive at discharge, 77% (n=5,853) were hospitalized for over 24 hours.

Table 1. Reported discharge status of 8,050 TBI patients, Tennessee 2015

Patient Status	N	%
Alive at Discharge	7,214	90
Discharged with self-care or non-skilled assistance (routine discharges)	4,290	53
Discharged to a residential, rehabilitation, or other long term care facility (includes hospice home care)	2,562	32

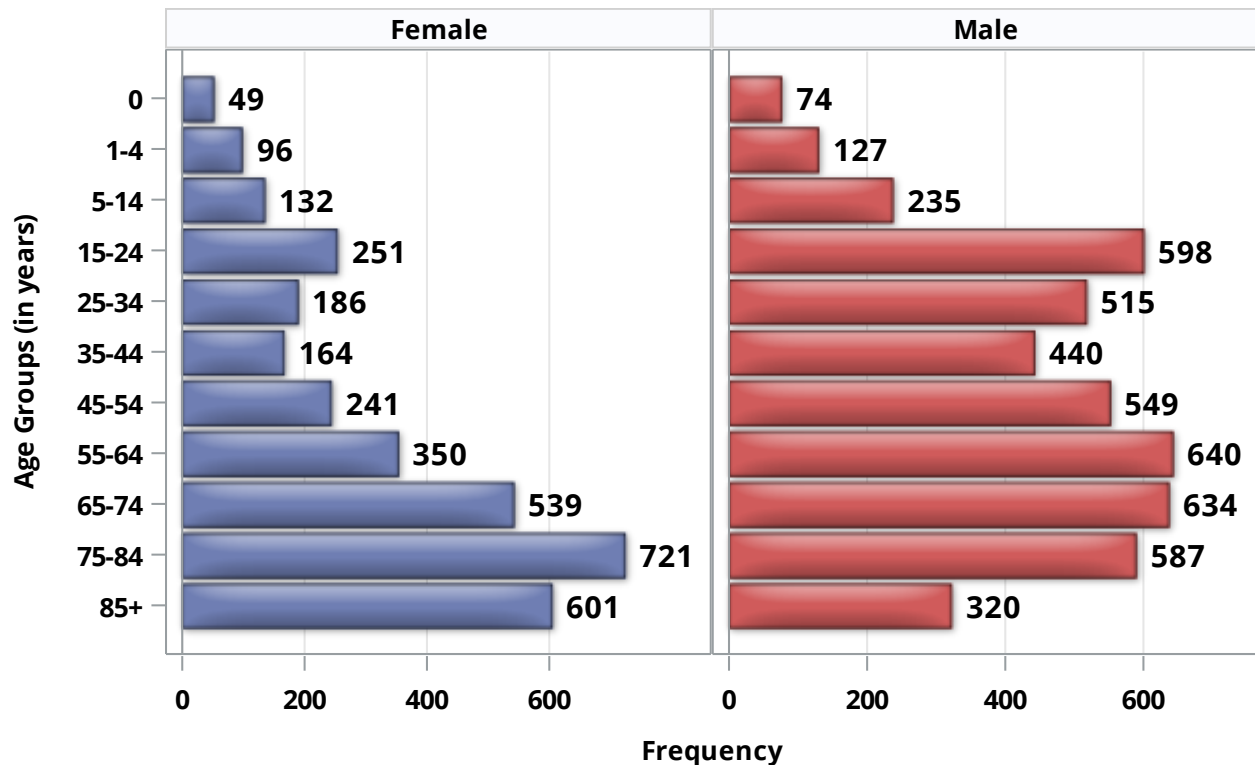
Demographics

The majority of traumatic brain injury-related hospitalizations occur in the senior population; almost 55% (n=4,382) of patients with a reported TBI were over 55 years of age.

Roughly 60% (n=4,720) of TBIs overall were males. In each age group, more males were hospitalized for or died due to a TBI-related cause, with the exception of patients over 75 years of age, where more females were hospitalized or expired (Figure 1).

*Until recently, males sustained more TBIs in **every** age group.*

Figure 1. Number of TBI-Related Patients by Age Group and Sex, 2015.



Traumatic Brain Injury Registry 2015 Final Data

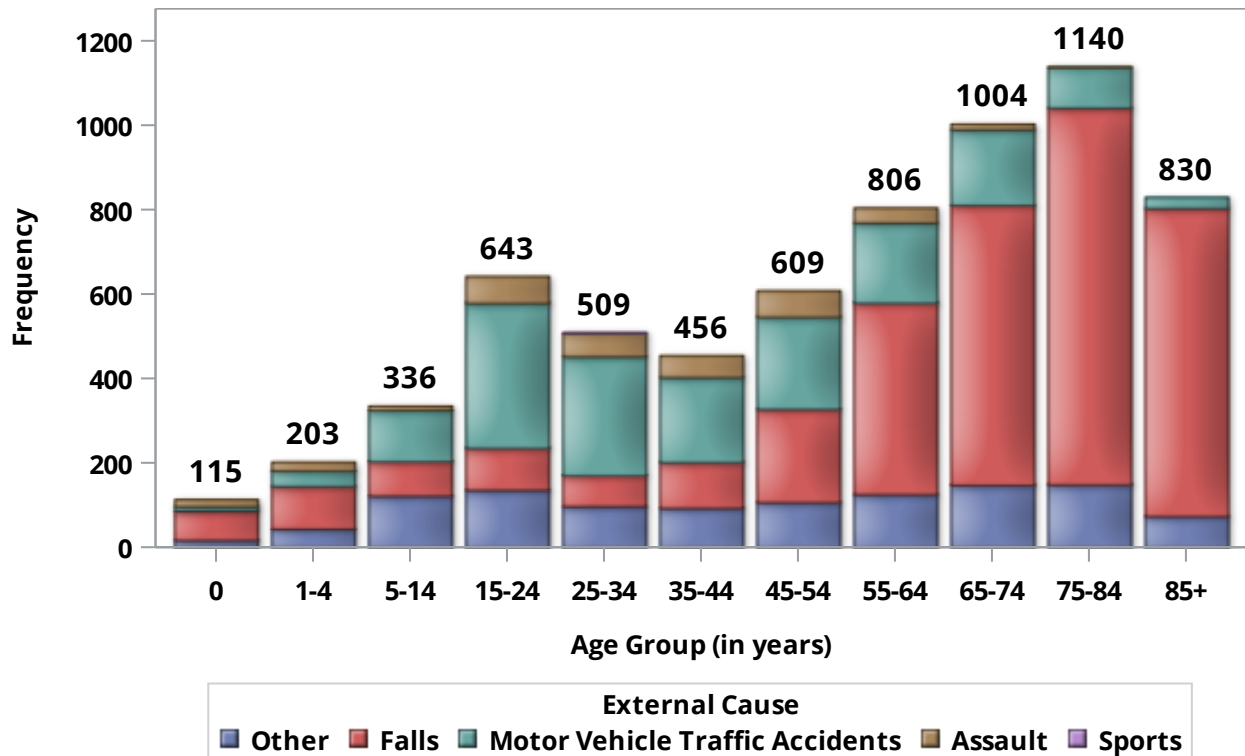
Source: Tennessee Department of Health, Division of Family Health and Wellness

Over 82% (n=6,617) of reported TBI patients were white, while only 12% (n=978) were black. Black men were twice as likely (68%, n=666) to be hospitalized for a TBI as black women (32%, n=312).

External Causes

Since the TBI Registry began collecting data in 1996, the two leading causes of traumatic brain injuries in Tennessee have been accidental falls and motor vehicle traffic accidents. Falls have been the most frequent cause of TBI-related hospitalization since 2008, when it surpassed motor vehicle accidents². The highest risk of traumatic brain injury from falls is in children 0-4 years of age and seniors, ages 55 and above (Figure 2).

Figure 2. External Causes of Traumatic Brain Injury by Age Group, 2015.



Traumatic Brain Injury Registry 2015 Final Data

Source: Tennessee Department of Health, Division of Family Health and Wellness

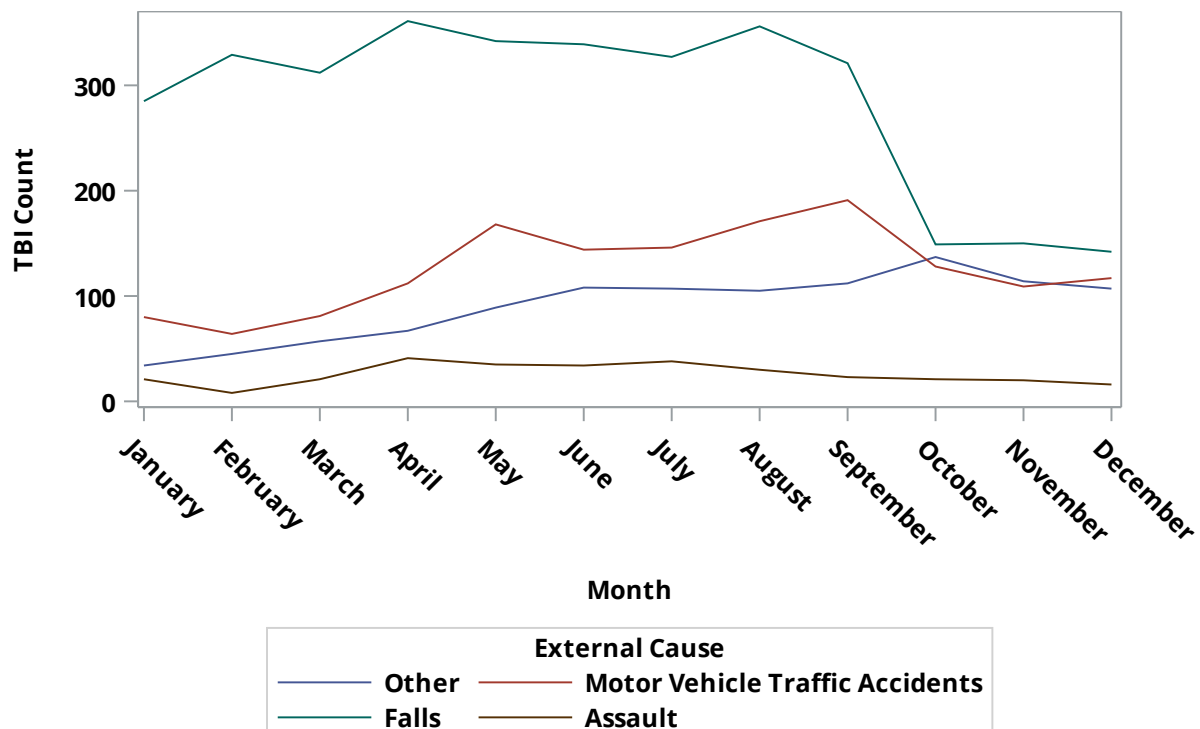
Also staying in trend with previous years, motor vehicle traffic accidents are the most frequent cause of TBI-related hospitalizations and deaths in patients ages 5 to 54, although the incidence of these overall has decreased.

2. Traumatic Brain injury Registry, historical data, 1996-2014

Males were more likely to be hospitalized by a motor vehicle-related (64%, n=1,096) or assault-related TBI (79%, n=254) than women. However, slightly more women (52%, n=1,801) sustained TBIs from falls than men, particularly in the age groups over 75.

Motor vehicle traffic accident-related TBI hospitalizations increased slightly in the summer months of 2015 (May-September). Fall-related TBI hospitalizations sharply decreased from 329 cases in September to 154 cases in October. Fall-related TBIs remained relatively low through December (Figure 3).

Figure 3. Number of TBI Patients by External Cause and Month, 2015.



Traumatic Brain Injury Registry 2015 Final Data

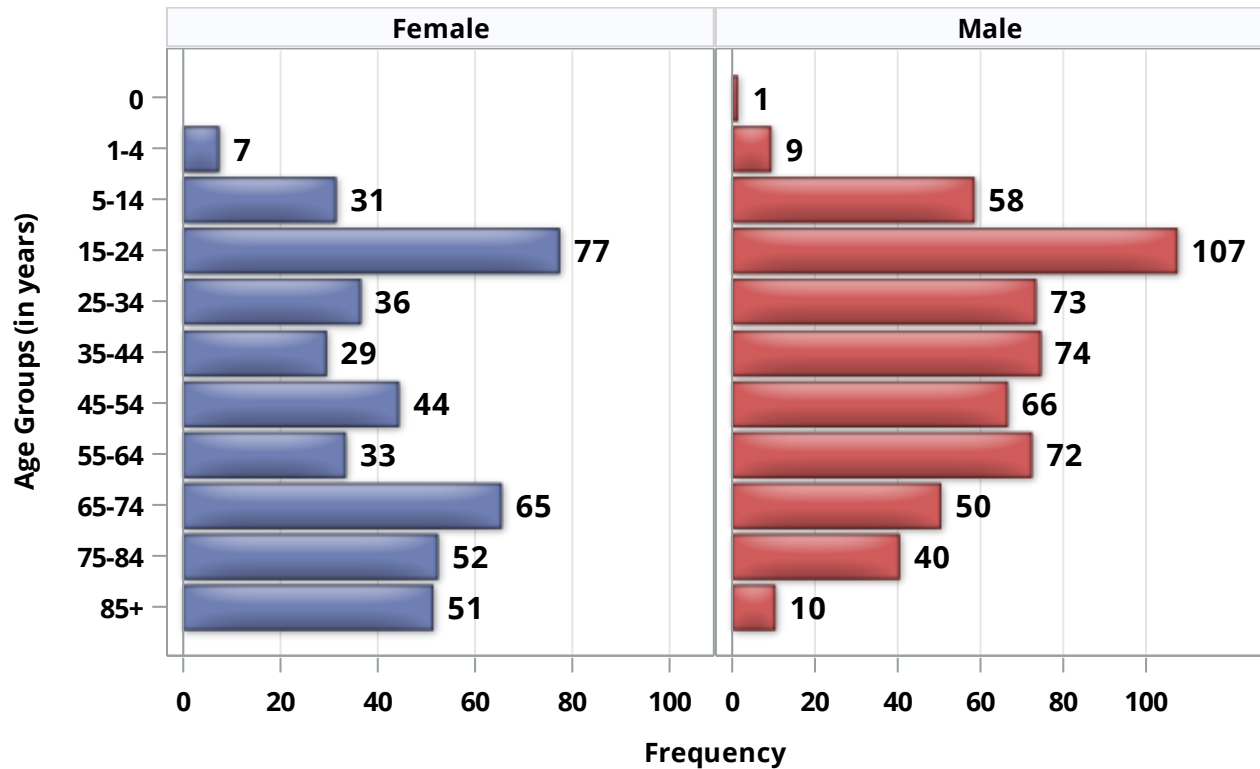
Source: Tennessee Department of Health, Division of Family Health and Wellness

Concussions

During 2015, 985 patients were hospitalized with a concussion as the primary diagnosis, and 2,120 patients had a concussion in any diagnosis position. Overall, 57% (n=560) of primary concussions were male, and almost 20% (n=184) were in the 15-24 age group alone (Figure 4).

Less than 5% of concussions captured by the Registry were sports-related.

Figure 4. Patients with Concussion as Primary Diagnosis by Age Group and Sex, 2015.



Traumatic Brain Injury Registry 2015 Final Data

Source: Tennessee Department of Health, Division of Family Health and Wellness

In April 2013, the Tennessee General Assembly passed a sports concussion law aimed at increasing awareness of traumatic brain injuries and reducing youth sports concussions. In total, only 13 TBI patients hospitalized with a concussion were due to sports. Between the ages of 15 and 24, where concussions are most prevalent, less than 5% (n=6) of primary concussions were sports-related. This is likely an underestimate of the scope of sports-related concussions in Tennessee. Since this analysis is limited to inpatient hospitalizations and deaths, it does not capture cases seen in emergency departments or by primary care providers and athletic trainers.

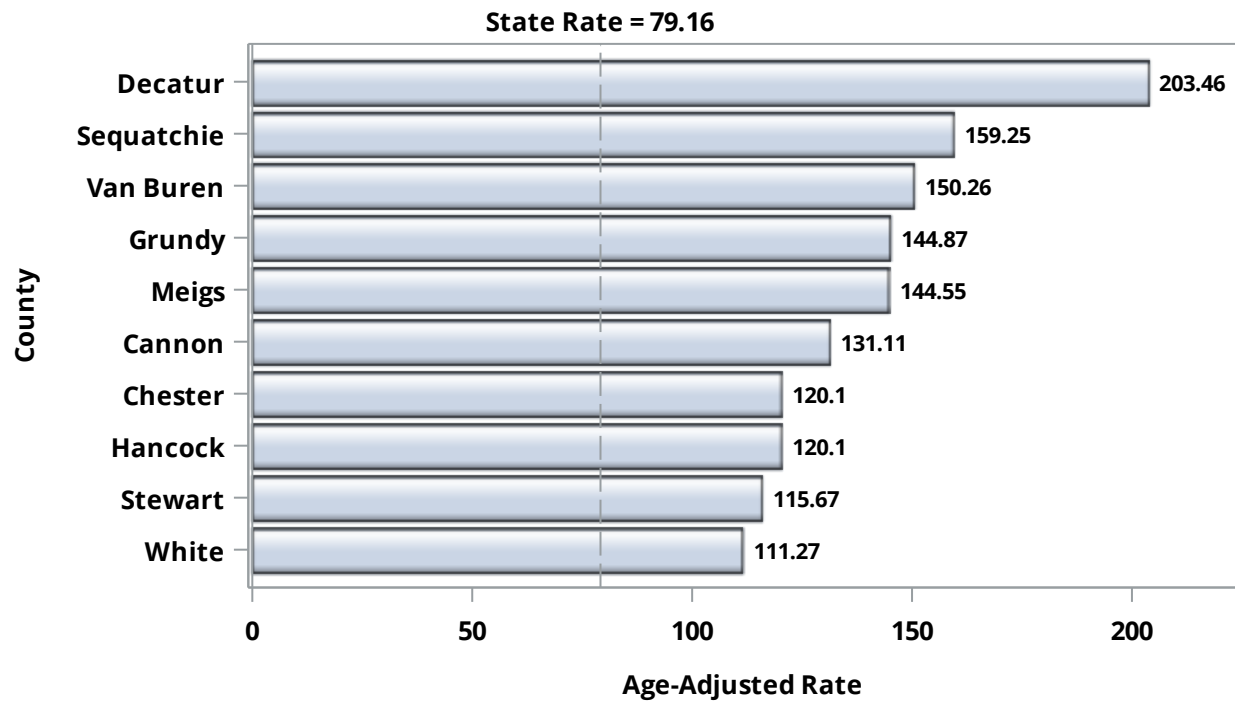
Rates

Unlike earlier calculations that included all TBI patients reported to and matching the legislative rules of the Registry, the following rate calculations take into account Tennessee residents only. This distinction was chosen in order to provide the most accurate rates possible given the data.

Hospitalization Rates

In 2015, the statewide age-adjusted rate of traumatic brain injury hospitalizations was 79.16 cases per 100,000 population (95% CI = 77.06, 81.26). The TBI-related hospitalization rates of the residents in Decatur County were twice as high as the state rate (Figure 5).

Figure 5. Age-Adjusted TBI Hospitalization Rates per 100,000 Tennesseans, 2015



Traumatic Brain Injury Registry 2015 Final Data

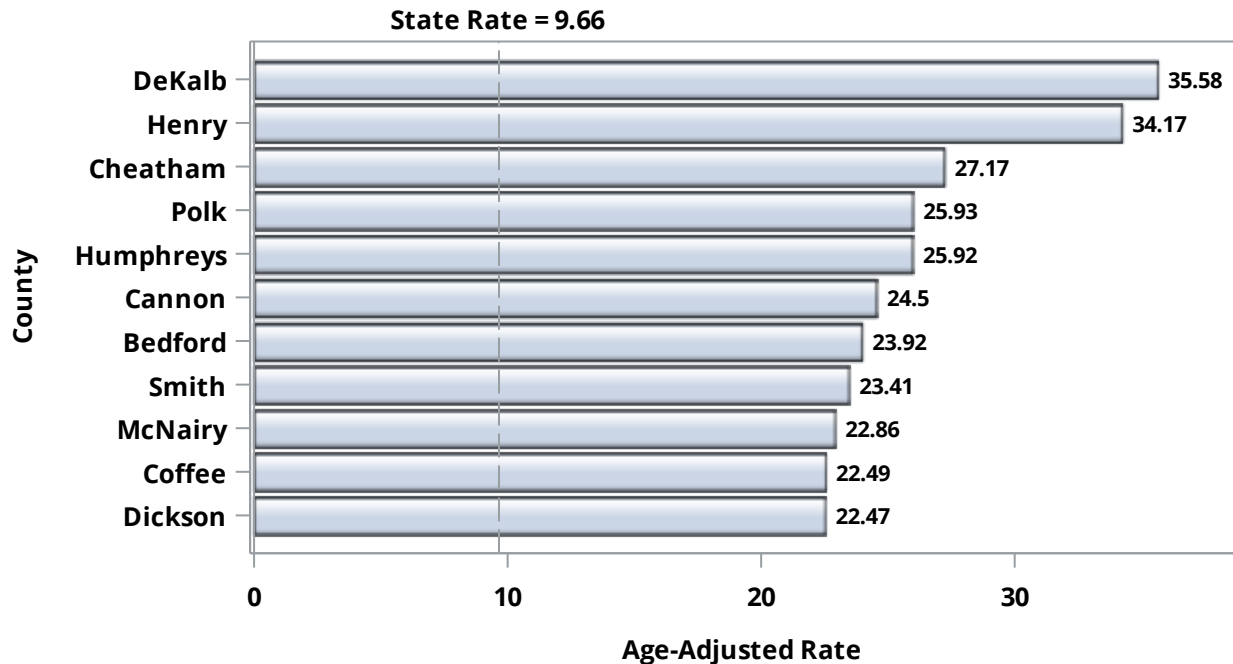
Rates based on 2014 County-Level Population Estimates provided by the Census Bureau

Source: Tennessee Department of Health, Division of Family Health and Wellness

Mortality Rates

The age-adjusted TBI mortality rate of Tennesseans in 2015 was 9.66 TBI-related deaths per 100,000 population (95% CI = 8.93, 10.39). Many counties had death counts under 20, which, as stated earlier, may cause the age-adjusted rate to be statistically unstable. Mortality rates in five counties, DeKalb, Henry, Cheatham, Polk, and Humphreys, were more than twice as high as the state rate (Figure 6).

Figure 6. Age-Adjusted TBI Mortality Rates per 100,000 Tennesseans, 2015.



Rates based on 2014 County-Level Population Estimates provided by

Tennessee Department of Health, Division of Policy, Planning, and Analysis

Source: Tennessee Department of Health, Division of Family Health and Wellness, Traumatic Brain Injury Registry 2015 Final Data

It is important to distinguish that the deaths captured by the Registry are those that happen during hospitalization or before arrival at reporting hospitals. Therefore, although these likely represent the most severe cases, they do not represent all TBI-related deaths in Tennessee.

Additional Information

The average length of stay for a TBI-related hospitalization in 2015 was 6 days, remaining steady from the second half of 2014³.

Over 76% (n=6,140) of reported TBIs involved a Tennessee resident, while almost 24% (n=1,910) involved non-residents, primarily from the 8 states bordering Tennessee.

Table 2. State of Residence of 8,050 TBI Patients, 2015

State	N	%
Alabama	89	1.11
Arkansas	219	2.72
Georgia	319	3.96
Kentucky	286	3.55
Mississippi	367	4.56
Missouri	36	0.45
North Carolina	58	0.72
Virginia	305	3.79
Other States	231	2.88
Tennessee	6,140	76.26
TOTAL	8,050	100

Conclusion

TBI still contributes to a significant portion of death and disability in the State of Tennessee, but continuous surveillance allows us to target interventions to alleviate those burdens. The findings above emphasize the continued need for resources for TBI patients in Tennessee.

3. Ramirez, A. Surveillance of Traumatic Brain Injury-Related Hospitalizations in Tennessee, July-December 2014. Tennessee Department of Health, Nashville, TN.

Acknowledgements

The Tennessee Department of Health would like to acknowledge the reporting hospitals across the State of Tennessee.

Contact Information

Additional TBI reports and fact sheets may be found at <https://www.tn.gov/health/topic/tbi>. For any additional information on the Traumatic Brain Injury Program, please call 1.800.882.0611.

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